

BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

Docket No.: 2019-224-E

South Carolina Energy Freedom Act (House Bill 3659) Proceeding Related to S.C. Code Ann. Section 58-37-40 and Integrated Resource Plans for Duke Energy Carolinas, LLC

Docket No.: 2019-225-E

South Carolina Energy Freedom Act (House Bill 3659) Proceeding Related to S.C. Code Ann. Section 58-37-40 and Integrated Resource Plans for Duke Energy Progress, LLC

**VOTE SOLAR'S
PARTIAL PROPOSED ORDER**

I. INTRODUCTION

This matter relates to the implementation by Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (“DEC” and “DEP,” respectively, and collectively referred to as the “Companies” or “DEC/DEP”) of integrated resource planning (“IRP”) requirements enacted by the South Carolina Energy Freedom Act (“Act 62”).

The requirements put forth by Act 62 are intended to ensure that the Companies continue to meet their energy and demand needs in a way that furthers the long-term interests of South Carolina ratepayers. As the electric utility sector undergoes transformative shifts related to new technologies, a changing physical environment, and increased attention paid by a variety of stakeholders to carbon emissions, the need for prudent and reasonable long-term planning is more critical now than ever. Our review of the Companies’ Plans must be responsive to these long-term trends. We find that 2020 Integrated Resource Plans proposed by DEC/DEP (collectively, the “Proposed IRPs”) do not appropriately consider foreseeable and material risks and opportunities related to long-term, climate-related electricity sector trends, and therefore they do not meet the “most reasonable and prudent” standard as set forth in Act 62. Accordingly, the Commission rejects the Proposed IRPs. This Order directs the Companies to file Modified Integrated Resources Plans that implement several changes to the Companies’ resource planning methodology and update the Companies’ Short Term Action Plans, and further directs the Companies to make several substantial revisions to their planning processes to integrate climate-related risks, which DEC/DEP will be required to implement in its next full IRPs. This Order also directs the Companies to convene a stakeholder process to determine appropriate metrics and methodologies for planning for a reasonable and prudent long-term pathway for meeting energy and capacity needs.

A. Background on Integrated Resource Planning

Integrated Resource Planning is a robust and transparent structured process for ensuring that a jurisdiction’s electricity needs are met in a way that is consistent with the public interest. Integrated

resource planning emerged in the 1980s as a tool for ensuring oversight and embedding long-term thinking into electricity planning during a tumultuous period for electricity prices, and since its inception integrated resource planning has been adopted in various forms across the United States. Resource plans fulfill a unique role within utility regulation because they provide an opportunity to systematically consider all relevant risks, trends, and opportunities that are affecting the utility's assets and operations, then chart a path that best integrates those factors. When implemented prudently, integrated resource planning creates shared understanding and confidence between utility management, regulators, and stakeholders, along with improved outcomes around affordability, environmental sustainability, and reliability. In the context of an electric utility industry that once again finds itself subject to transformative trends, integrated resource planning will be critical for ensuring that the electricity grid continues to operate in the public interest.

Act 62 changed the procedural and substantive elements of resource planning in South Carolina. The law provides a list of components to be included in a utility's integrated resource plan and empowers the Commission to approve or deny the plans based on a list of factors that are weighed to determine whether the proposed IRP represents the most reasonable and prudent means of meeting the utility's energy and demand needs.

B. Notice and Intervention

By letter of October 29, 2020, the Clerk's Office of the Public Service Commission of South Carolina transmitted the Notice of Filing and Hearing and Pre-file Testimony ("Notice") in the above-referenced dockets to DEC/DEP and instructed the Companies to publish the Notice in newspapers of general circulation in the affected areas by December 1, 2020 and provide proof of publication on or before December 15, 2020. The Notice indicated the nature of the proceeding and advised all parties desiring participation in the scheduled proceeding of the manner and time in which to file appropriate pleadings. On December 9, 2020, the Companies filed an affidavit demonstrating that the Notice was duly published in accordance with the instructions set forth in the October 29, 2020 letter.

Petitions to Intervene were received from South Carolina Solar Business Alliance (“SCSBA”), South Carolina Coastal Conservation League (“CCL”), Southern Alliance for Clean Energy (“SACE”), Upstate Forever, Sierra Club, and Natural Resources Defense Council (“NRDC”), Johnson Development Associates Incorporated (“JDA”), Vote Solar, and Nucor Steel. The South Carolina Department of Consumer Affairs (“SCDCA”) was notified of this proceeding pursuant to S.C. Code Ann. § 37-6-604(C) and submitted a petition to intervene. The Petitions to Intervene of SCSBA, CCL, SACE, JDA, Vote Solar, and SCDCA were not opposed by the Companies, and no other parties sought to intervene in this proceeding. The South Carolina Office of Regulatory Staff (“ORS”) is automatically a party to this docket by virtue of S.C. Code Ann. § 58-4-10(B).

II. REQUIREMENTS FOR INTEGRATED RESOURCE PLANNING UNDER ACT 62

A. Statutory Requirements

South Carolina Code Ann. Section 58-37-10(2) defines an integrated resource plan as a “plan which contains the demand and energy forecast for at least a fifteen-year period, contains the [utility’s] program for meeting the requirements shown in its forecast in an economic and reliable manner, including both demand-side and supply-side options, with a brief description and summary cost-benefit analysis, if available, of each option which was considered...” Act 62 requires that regulated electric utilities in South Carolina must prepare and submit IRPs to the Commission at least every three years, and upon receiving an IRP the Commission must establish a proceeding to review the utility’s IRP and provide an opportunity for intervening parties to provide evidence for the purposes of "obtaining evidence concerning the [IRP], including the reasonableness and prudence of the plan and alternatives to the plan raised by intervening parties." S.C. Code Ann. § 58-37-40(C)(1).

S.C. Code Ann. § 58-37-40(B)(1) states that utility IRPs must include the following elements:

- a. A long-term forecast of the utility's sales and peak demand under various reasonable scenarios;
- b. The type of generation technology proposed for any generation facility contained in the plan and its proposed capacity, including fuel cost sensitivities under various reasonable scenarios;

- c. Projected energy purchased or produced by the utility from a renewable energy resource;
- d. A summary of electrical transmission investments planned by the utility;
- e. Several resource portfolios developed with the purpose of fairly evaluating the range of demand-side, supply-side, storage, and other technologies and services available to meet the utility's service obligations. Such portfolios and evaluations must include an evaluation of low, medium, and high cases for the adoption of renewable energy and cogeneration, energy efficiency (EE), and demand response (DR) measures, including consideration of:
 - i. customer energy efficiency and demand response programs;
 - ii. facility retirement assumptions; and
 - iii. sensitivity analyses related to fuel costs, environmental regulations, and other uncertainties or risks;
- f. Data regarding the utility's current generation portfolio, including the age, licensing status, and remaining estimated life of operation for each facility in the portfolio;
- g. Plans for meeting current and future capacity needs with the cost estimates for all proposed resource portfolios in the plan;
- h. An analysis of the cost and reliability impacts of all reasonable options available to meet projected energy and capacity needs; and
- i. A forecast of the utility's peak demand, details regarding the amount of peak demand reduction the utility expects to achieve, and the actions the utility proposes to take in order to achieve that peak demand reduction. S.C. Code § 58-37-40(B)(1).

S.C. Code § 58-37-40(B)(1).

In addition, S.C. Code Ann. § 58-37-40(B)(2) states that IRPs may include distribution resource plans or integrated system operation plans.

No later than three hundred days after an IRP is filed, the Commission must issue a final order approving, modifying, or denying the plan. S.C. Code Ann. § 58-37-40(C)(1). If the Commission modifies or rejects the plan, the electrical utility must submit a revised plan addressing concerns identified by the Commission and incorporating revisions for approval. S.C. Code Ann. § 58-37-40(C)(3). Once the revised plan is submitted, the Office of Regulatory Staff has sixty days to review the plan and submit a report to the Commission on the sufficiency of the revised plan. *Id.* Other parties to the proceeding may also submit comments on the revised plan during this time. *Id.* Within sixty days of the filing of ORS's report, the Commission may opt to accept the revised plan or mandate further changes. *Id.*

Electrical utilities must also submit annual updates to their integrated resource plans. S.C. Code Ann. § 58-37-40(D)(1). The Office of Regulatory Staff must review each annual update and submit a report to the Commission providing a recommendation to the Commission, at which time the Commission may either accept the update or direct further changes to the plan. S.C. Code Ann. § 58-37-40(D)(2).

B. Standard of Review

Act 62 directs the Commission to approve an electric utility's integrated resource plan if the Commission determines that the plan represents the "most reasonable and prudent means" of meeting the utility's energy and capacity needs. S.C. Code Ann. § 58-37-40(C)(2). In making its determination, the Act directs the Commission to consider, in its discretion, several factors:

- a. Resource adequacy and capacity to serve anticipated peak electrical load, and applicable planning reserve margins;
- b. Consumer affordability and least cost;
- c. Compliance with applicable state and federal environmental regulations;
- d. Power supply reliability;
- e. Commodity price risks;
- f. Diversity of generation supply; and
- g. Other foreseeable conditions that the Commission determines to be for the public interest.

Id.

This standard allows substantial discretion to the Commission in terms of what constitutes "most reasonable and prudent," and in defining what additional conditions should be given consideration in pursuit of the public interest. The Commission defines "reasonable" in this context as rational, logically consistent, and the result of sound judgment. Specifically, plans demonstrate reasonableness by meeting the requirements of Act 62 and comporting with industry norms and widely-known IRP best practices. The Commission defines "prudent" as giving due consideration to actual and foreseeable future conditions and risks. These considerations should take into account the relative costs and benefits of avoiding potential future risks, including but not limited to regulatory, capital, or fuel risks. Although affordability is an important consideration, the "most reasonable and prudent"

standard is distinct from a least-cost standard that would simply approve the plan that minimizes short-term costs. The inherent uncertainty of resource planning and the Commission's duty to preserve affordability for South Carolina ratepayers in the long term requires that it take a long-term view to potential risk exposure.

In making its determination, the Commission must rely on the facts in the record before it; this means that the IRP and the record must provide sufficient information about each of the seven balancing factors to enable the Commission to determine if the IRP appropriately balances each of them. Act 62 requires that, in order to be approved, the plan must represent the *most* reasonable and prudent means of meeting the electrical utility's energy and capacity needs as of the time the plan is reviewed. S.C. Code Ann. § 58-37-40(C)(2). This provision of Act 62 implies it is insufficient to merely demonstrate that the plan is reasonable and prudent; instead, the resource plan must be found to be without material and meaningful flaws that detract or conflict with the reasonableness or prudence of the resource plan. IRPs must also continue to improve and respond as circumstances, standards and practices evolve.

III. HEARING

In order to consider the merits of this case, the Commission convened a hearing on this matter on April 26 – May 5, 2021, with the Honorable Justin T. Williams presiding. DEC was represented by E. Brett Breitschwerdt, Esquire; Frank R. Ellerbe III, Esquire; Heather Shirley Smith, Esquire; Rebecca J. Dulin, Esquire; and Samuel J. Wellborn, Esquire. DEP was represented by Frank R. Ellerbe III, Esquire; Heather Shirley Smith, Esquire; Rebecca J. Dulin, Esquire; and Samuel J. Wellborn, Esquire. SCSBA was represented by Benjamin L. Snowden, Esquire; John D. Burns, Esquire; and Richard L. Whitt, Esquire. CCL, SACE, Upstate Forever, Sierra Club, and NRDC were represented by Gudrun Elise Thompson, Esquire; and Katherine Lee Mixson, Esquire. JDA was represented by Courtney E. Walsh, Esquire; James Goldin, Esquire; and Weston Adams III, Esquire. Vote Solar was represented by R. Taylor Speer, Esquire and Robert P. Mangum, Esquire. Nucor Steel was represented by Michael

K. Lavanga, Esquire and Robert R. Smith, II, Esquire. Nanette S. Edwards, Esquire; Jeffrey M. Nelson, Esquire; and Andrew M. Bateman, Esquire, represented ORS. In this Order, ORS, SCSBA, CCL, SACE, Upstate Forever, Sierra Club, NRDC, JDA, Vote Solar, Nucor Steel, DEC, and DEP are collectively referred to as the “Parties” or sometimes individually as a “Party.”

DEC/DEP presented the direct testimonies of Glen Snider, Leon Brunson, Matthew Kalembo, Dewey S. Roberts, II, PE, Brian Bak, Dawn Santoianni, and Nick Wintermantel. ORS presented the direct testimony and exhibits of Lane Kollen, Philip Hayet, Stephen J. Baron, and Anthony M. Sandomato. SCSBA presented the direct testimony and exhibits of Arne Olson and Kevin Lucas. CCL, SACE, Upstate Forever, Sierra Club, and NRDC presented the direct testimony and exhibits of Jim Grevatt and James Wilson. Vote Solar presented the direct testimony and exhibits of Tyler Fitch. JDA and Nucor did not present witnesses at the hearing.

In response to the direct testimony filed by ORS, SCSBA, CCL, SACE, Upstate Forever, Sierra Club and NRDC, and Vote Solar, DEC/DEP presented the rebuttal testimony and exhibits of Mark Oliver, Dewey S. Roberts, II, PE, Nick Wintermantel, Glen Snider, Matthew Kalembo, Leon Brunson, and Jim Herndon. In response to DEC/DEP’s rebuttal testimony, ORS presented the surrebuttal testimony and exhibits of Stephen Baron, Lane Kollen, Anthony M. Sandomato, and Philip Hayet; SCSBA presented surrebuttal testimony and exhibits of Arne Olson and Kevin Lucas; SCSBA, CCL, SACE, Upstate Forever, Sierra Club, and NRDC presented surrebuttal testimony and exhibits of Rachel Wilson; CCL, SACE, Upstate Forever, Sierra Club, and NRDC presented surrebuttal testimony of Jim Grevatt, John Wilson, and Jim Wilson; and Vote Solar presented the surrebuttal testimony and exhibits of Tyler Fitch. The Commission also requested and received late-filed exhibits from several parties.

IV. **FINDINGS OF FACT**

Based on the Proposed IRPs, the testimony, and exhibits received into evidence at the hearing and the entire record of these proceedings, the Commission hereby makes the following findings of fact:

A. **Act 62 Requires Due Consideration of Identified Climate Risks in Resource Planning.**

1. There is a high degree of probability that physical, social, and economic factors expected to be driven by climate change in the near and long-term will impact DEC/DEP and its ratepayers. The Commission thus determines that certain material and foreseeable climate-related risks are within the public interest and otherwise contemplated by the various balancing factors enumerated in S.C. Code Ann. § 58-37-40(C)(2). These risks include: (i) physical risks to the Companies' assets and operations, (ii) risks of increased cost of capital due to shareholder concern around carbon-emitting assets, (iii) risks of stranded carbon-emitting assets, (iv) risks of regulation on carbon emissions, and (v) risks associated with DEC/DEP's ability to cost-effectively transition to net-zero carbon operations by 2050. These specifically identified climate-related risks are hereafter referred to, collectively, as "Identified Climate Risks." In making its determination on whether the Proposed IRPs are the "most reasonable and prudent" under S.C. Code Ann. § 58-37-40(C)(2), the Commission assesses whether the Proposed IRPs exercise due consideration of these specifically Identified Climate Risks.

B. **The Proposed IRPs Do Not Adequately Incorporate Identified Climate Risks.**

2. DEC/DEP failed to exercise due consideration of Identified Climate Risks in the Proposed IRPs. The Commission therefore rejects them as not adequately reasonable and prudent for meeting DEC/DEP's energy and capacity needs at this time. As further described in this Order, DEC/DEP shall submit Modified 2020 IRPs that implement certain specific changes within sixty (60) days of this Order (the "Modified 2020 IRPs"). Correcting the Companies' integrated planning process to properly account for Identified Climate Risks will require time for consideration by DEC/DEP, ORS,

and other stakeholders, and therefore this Order also identifies several changes to the Companies' IRP methodology, which shall be used in DEC/DEP's subsequent IRPs filed under S.C. Code Ann. § 58-37-40(A). All changes to DEC/DEP's IRP development methodologies required to be included in the Modified 2020 IRPs shall be reflected in DEC/DEP's subsequent annual updates filed under S.C. Code Ann § 58-37-40(D) (collectively, "Annual Updates"), along with subsequent IRPs.

3. It is prudent for the purposes of mitigating material and foreseeable risks for the Companies to conduct a periodical, systematic assessment of DEC/DEP's exposure to Identified Climate Risks (the "Assessment"). The Assessment shall include a study of: (i) the physical impacts of climate change on the Companies' assets, operations, and planning; (ii) the Companies' exposure to cost-of-capital impacts due to carbon-intensive assets; (iii) stranded asset risk and additional capital expenditures (e.g., retrofits for carbon capture and storage, etc.) on existing and proposed carbon-emitting assets; (iv) climate-related regulatory risk; and (v) transition risks to a net-zero generation portfolio by 2050. The Companies shall integrate into future IRPs the Assessment's outputs into model operation, plan development, scenario selection, and scenario evaluation using specific metrics and indicators to be developed as provided in this Order.

4. It is reasonable for the Commission to direct DEC/DEP to convene a stakeholder process for the purposes of considering and inviting stakeholder input and review on best practices to integrate assessment, management, and evaluation of Identified Climate Risks into the DEC/DEP's IRP development methodology (the "Stakeholder Group"). The Stakeholder Group's agenda shall include, at a minimum, developing inputs, methodology, and timeline for the Assessment. The Companies shall convene the Stakeholder Group in coordination with Intervenor and the Office of Regulatory Staff no later than sixty days from the date of this Order.

C. Assessing and Managing Identified Climate Risks

5. In assessing 2036-2050 operation and associated revenue requirements of its candidate resource plans, the Companies made unsupported assumptions. DEC/DEP assumed, without

supporting analysis: (i) that all candidate resource plans are consistent with DEC/DEP's commitment to operating net zero carbon emissions portfolio by 2050 (the "2050 Commitment"); and (ii) that each candidate resource plan's annual revenue requirement will escalate at a consistent, flat rate in years 2036-2050, despite acknowledging different resource needs across candidate plans. The Proposed IRPs consequently fail to consider the candidate resource plans' ability to feasibly or cost-effectively implement the 2050 Commitment, and fail to consider differences in cost or feasibility of implementation between candidate resource plans. It is prudent to require DEC/DEP to include explicit consideration of meeting the 2050 Commitment and evaluate the relative difference in cost and feasibility of implementation across candidate resource plans. The Companies shall integrate in future IRPs implementation of a net-zero carbon emissions system by 2050 into their model operation, plan development, scenario selection, and scenario evaluation, using metrics and indicators developed within the Stakeholder Group identified in this Order.

6. DEC/DEP did not use a reference carbon price that correctly approximates exposure to climate-related regulatory risks. The Companies shall use U.S. Energy Information Administration 2020 Annual Energy Outlook reference CO₂ prices for its subsequent IRPs and Annual Updates.

7. It is reasonable for Proposed IRPs to consider additional regional coordination and/or capacity sharing arrangements in furtherance of securing the most prudent and reasonable means of meeting the Companies' energy and capacity needs. DEC/DEP shall include in the Short Term Action Plan sections of the Modified 2020 IRPs a discussion of required actions to implement joint capacity planning, and continue to monitor the progress of additional consideration of regional planning as provided by Act 187 of the 123rd session of the South Carolina General Assembly (2019-2020) [Electricity Market Reform Measures Study Committee].

8. To further support alignment of stakeholders and build shared understanding on development of a just and reasonable IRP, it is reasonable for the Commission to order DEC/DEP to procure an intervenor license for its capacity expansion software. The Companies shall work with

Anchor Software and EnCompass to procure a cost-effective virtual stakeholder license to assist collaboration on future IRPs.

V. REVIEW OF THE EVIDENCE AND EVIDENTIARY CONCLUSIONS

A. Act 62 Requires Due Consideration of Identified Climate Risks in Resource Planning.

The evidence in support of this finding of fact is found in the Proposed IRPs, pleadings, testimony and exhibits in these Dockets, and the entire record in this proceeding.

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT NO. 1

Vote Solar Evidence

In direct testimony, Vote Solar Witness Tyler Fitch defined climate-related risks as “potential negative future impacts on an entity due to physical, social, or economic factors driven by climate change.” (Tr. p. 736.10 l. 5-6.) Mr. Fitch’s testimony discussed economic, financial, and analytical developments that are accelerating the ability to identify and act on climate-related risks. (Tr. p. 736.12 l. 3 – 736.19 l. 2.) As evidence of the existence and materiality of these risks, Mr. Fitch provided statements from leading economic and financial institutions. (Tr. p. 736.18 l. 2-4 (BlackRock requests firms “disclose a plan for how their business model will be compatible with a net zero economy”) and p. 736.16 l. 14-16 (U.S. Commodities Futures Trading Commission’s conclusion that, “Transition risks arise when firms fail to prepare for or recognize broader market transitions. In a speedy transition to a net-zero economy, fossil-fuel industry assets might become stranded.”).) Based on these developments, Mr. Fitch concludes:

“There is a common understanding of climate-related risks; they are already substantially impacting firms in the US utility sector; investors and the public are taking those risks seriously; the tools exist to pinpoint climate risks; stranded asset risks are in focus; and [utilities] are converging on a net-zero by 2050 trajectory. These developments form a common foundation of understanding . . . [for] regulators to . . . manage climate risk.”

(Tr. p. 736.18 l. 12 – 736.19 l. 2.)

In an attachment to his direct testimony titled, ‘Carbon Stranding: Climate Risk and Stranded Assets in Duke’s Integrated Resource Plan’ (the “Carbon Stranding Report”), Mr. Fitch provided an overview of DEC/DEP’s exposure to climate change-related risks. (*See, e.g.*, HE. 22, Ex. TF-2 at p. 16–17 [generation assets]; p. 17–18 [fulfillment of stakeholder’s environmental, social, and governance goals]; p. 18–20 [increased competition from cost declines of zero-emissions generation]; and p. 21–22 [regulatory costs].) Mr. Fitch calculated potential stranded asset costs to DEC/DEP ratepayers based on DEC/DEP’s Base Case with Carbon Policy scenario and found that stranded asset costs could reach \$4.8 billion. (HE. 22 Ex., TF-2 at p. ii.)

Mr. Fitch also discussed the implications of the emergence of climate-related risk for integrated resource planning. (*See* Tr. p. 736.31 – 736.36.) As a tool for assessing and mitigating long-term risks, Mr. Fitch testified, integrated resource planning should incorporate material and foreseeable climate-related risks in order to fulfill its purpose of ensuring the electric utility system continues to develop in the public interest. (*See generally* Tr. p. 736.34 l. 23 – 736.25 l. 2.)

DEC/DEP Evidence

DEC/DEP Witness Snider is the Companies’ ‘Director of Carolinas Integrated Resources Planning and Analytics’ and is primarily responsible for supervision of the Companies’ IRP process. He further oversees the analytical functions relative to the Companies’ IRPs offered in the Carolinas. (Tr. p. 62.2 l. 6-14.) Mr. Snider and other DEC/DEP witnesses attempted, at great length, to insulate the Companies’ resource planning from consideration of climate change risk. (*See, e.g.*, Tr. p. 115 l. 12-16 (“The IRP has a role in reducing our climate footprint . . . [b]ut some of those risks are well beyond the scope of an integrated resource planning process.”) and p. 100 l. 2-12 (“it’s a risk that’s not within the construct of an IRP”) [Snider]; Tr. p. 1527 l. 7-13 (“physical mitigation and reputation risk [of climate change], both . . . are outside of the scope of the IRP process”) and p. 1531 l. 9-25 (“it would be inappropriate to capture the analysis and results of [a climate resiliency study] within the silo of the IRP process”) (emphasis added) [Santoian].)

Mr. Snider's testimony, however, belies concessions he allowed during cross examination by Vote Solar relative to the Commission's authority to regulate some of these risks under S.C. Code Ann. § 58-37-40. Mr. Snider testified the Commission has "a lot of latitude" under Act 62 to consider long-term risks; maintains "broad authority" to regulate risks that would be associated with a stranded asset; and is required to "identify and mitigate ratepayer risk" in the IRP context, including "cost and reliability impacts." (Tr. p. 79 l. 9 - p. 80 l. 22, p. 90 l. 15-19, and p. 74 l. 6-23.) Mr. Snider further admitted the Commission's role in approving the Companies' IRPs impacts how DEC/DEP will achieve Duke Energy Corporation's well-publicized commitment to net-zero carbon emission by 2050. (*See* Tr. p. 108 l. 24 - p. 109 l. 5.)

The Companies' witnesses admit there is precedent for the Commission's authority to require that the IRP demonstrate the utility's ability to achieve the 2050 Commitment. DEC/DEP witness Dawn A. Santoianni is the Companies' 'State Energy Policy Director for North Carolina' and is responsible for analyzing and identifying effective energy policy for the Companies' and shareholders across the Carolinas. (Tr. p. 224.2 l. 5-19.) Ms. Santoianni asserts Vote Solar requests the Commission to mandate a climate policy (Tr. p. 1528. l. 3-8) and directs the Commission to the Companies' effort to address climate change risk in Duke Energy Corporation's Enterprise Risk Management process (Tr. p. 1539.19. l. 13-22). On the other hand, Santoianni allowed that Dominion Energy South Carolina, Inc.'s ("DESC") 2050 net-zero carbon goal was expressly noted and considered by Commission Order No. 2020-832 (the "2020 DESC IRP Order"). (Tr. p. 1545 l. 8-16.; *see also* HE. 3 p. 5 (requiring additional modeling to show that DESC may "mak[e] good on [its] net-zero carbon commitment, currently lacking in the [its] IRP.")) She further acknowledged the North Carolina Utilities Commission held DEC/DEP should consider their 2050 Commitment in the Companies' IRP filings. (Tr. p. 1544 l. 16-24.; *see also* HE. 41 p. 7-8 (noting the 2050 Commitment "will likely require aggressive restructuring of the Companies' resource portfolios" and finding "it is appropriate that DEC and DEP in their 2020 IRPs identify alternative resource portfolios that offer prospects for supporting

and advancing the stated Duke Energy corporate goal.”.) Snider also acknowledged the 2020 DESC IRP Order requires the Companies to give “due consideration to actual and foreseeable future conditions and risks.” (Tr. p. 86 l. 5-16; HE. 3 p. 3.)

DEC/DEP Witness Snider’s rebuttal testimony applied what Snider calls a ‘holistic’ lens to consider risks to the Proposed IRPs. (Tr. p. 1186.116 l. 2-4.) Snider acknowledged that “carbon emissions associated with natural gas generation carries [sic] energy policy risk exposure and unknown costs to co-fire with a zero GHG emissions fuel, or other carbon recovery options to mitigate risk,” (Tr. p. 1586.118 l. 11-12) but characterized Witness Fitch’s assessment of climate-related risks as “[failing] to recognize a broader holistic perspective.” (Tr. p. 1586.118 l. 19-20.)

Commission Conclusion

A long-term resource planning process is effective insofar as it considers the actual risks, trends, and opportunities relevant for the public utility and its ratepayers. As those risks, trends, and opportunities evolve, so too must the process for evaluating those plans. S.C. Code Ann. § 58-37-40(C)(2)(g) gives the Commission discretion to identify conditions in the public interest that are appropriate for considering, as a balancing factor, alongside more conventional resource planning criteria. *See generally* S.C. Code Ann. § 58-37-40(C)(2). A simplistic short-term “least-cost” standard, under Act 62, is no longer sufficient for determining that a resource plan is the *most* reasonable and prudent plan for meeting a utility’s energy and capacity needs. *See generally* S.C. Code Ann. § 58-37-40(C)(2). In this sense, Mr. Snider’s emphasis on a holistic approach to resource planning (Tr. p. 1586.118 l. 19-20) is consistent with the Commission’s view of the proper perspective for assessing the Proposed IRPs.

The Carbon Stranding Report and Mr. Fitch’s testimony demonstrate that some climate risks may potentially have immediate and material implications on the Companies’ operations, and consequently, the expense borne by ratepayers. The Carbon Stranding Report further demonstrates the magnitude of potential ratepayer costs. The Commission finds that the Identified Climate Risks may

have material and foreseeable consequences to the Companies' operations and financial health. The Commission also agrees with Witness Fitch that integrating Identified Climate Risks into the Companies' IRPs does not conflict with pursuing affordability and reliability, and instead, that these goals are "tightly connected." (Tr. 730 l. 2-6.) The Commission therefore will consider the Identified Climate Risks as material and foreseeable within the public interest, and any prudent IRP must demonstrate due consideration of these risks. There are inevitable challenges associated with quantifying any long-term risk, but these challenges should not and do not preclude the Commission from considering them.

Notwithstanding the Companies' belief that climate-related risks are best addressed outside the resource planning process, decisions made within the Companies' IRPs have significant implications for ratepayers, and the Commission alone exercises discretion on the conditions and factors to be considered in evaluating the IRPs. Ms. Santoianni admits as much when testifying DEC/DEP's resource plans, in fact, would incorporate climate risks, but for enactment by policymakers. (Tr. p. 1529 l. 17-21.) Further, while Ms. Santoianni's explanation of Duke Energy Corporation's risk management strategy illuminates how climate risk is managed on a corporate basis, the Commission's charge in this proceeding is to determine whether DEC/DEP exercised due consideration of the Identified Climate Risks. This requires that the Companies show their climate-related risk management practice, rather than simply aver that such a process exists. The Commission agrees with Witness Snider that a holistic lens is necessary for considering DEC/DEP's proposed plans. A holistic assessment, however, requires that the Commission consider all relevant factors, including the Identified Climate Risks.

B. The Proposed IRPs Do Not Adequately Incorporate Identified Climate Risks.

The evidence in support of these findings of fact is found in the Proposed IRPs, pleadings, testimony and exhibits in these Dockets, and the entire record in this proceeding.

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT NO. 2-4

Vote Solar Evidence

Mr. Fitch performed a detailed assessment of the Proposed IRPs (*see generally* Tr. p. 736.37 – 736.97) from which he derived two critical conclusions: the Companies had “not adequately assessed or managed climate-related risks” (Tr. p. 736.39 l. 14-17) and that such an approach, “ignore[d] or underplay[ed] substantial potential costs to ratepayers” (Tr. p. 736.95 l. 4-7). Mr. Fitch’s conclusions were based on a finding that DEC/DEP did not conduct a systematic climate-related risk assessment or incorporate physical risks into the Proposed IRPs. (*See* Tr. p. 736.40 l. 10 – 736.43 l. 18; Tr. p. 736.44 l. 1 – 736.49 l. 10.) Fitch also testified the Proposed IRPs: (i) used a carbon reference price that did not provide an appropriate benchmark for potential regulatory costs (*See* Tr. p. 736.49 l. 11 – 736.53 l. 2); (ii) did not fully incorporate distributed energy resources or increased regional coordination, including joint capacity planning (*See* Tr. p. 736.53 – 736.64); and (iii) failed to appropriately evaluate the potential costs associated with responding to climate-related transition risks over the long term in its plans (*See* Tr. p. 736.64 – 736.94).

DEC/DEP Evidence

DEC/DEP witnesses did not equivocate, first, that climate risks impact the Companies and, second, that these risks were not considered in the Proposed IRPs. DEC/DEP, in fact, concede the Companies’ generation portfolio is exposed to climate-related physical, economic and regulatory risks, including DEC/DEP’s cost of capital. (HE. 47.) Mr. Snider testified the ‘Duke Energy 2020 Climate Report’ (the “Climate Report”) (HE. 5) is the Corporation’s acknowledgement of many factors relative to the impact of climate risks to DEC/DEP. To that end, Mr. Snider testified the Corporation acknowledges climate change affects its profitability and value and presents “considerable” economic risk, along with stranded asset risk. (Tr. p. 115 l. 2-4 and p. 117 l. 4-11; Tr. p. 118 l. 2-7.) Duke Energy Corporation further addresses many of these risks in filings with the U.S. Securities and Exchange Commission. (*See* HE. 6.)

Notwithstanding, the Companies' Witnesses admit candidly that these risks were not considered in their Proposed IRPs. Mr. Snider testified DEC/DEP did not consider the "financial health of the Compan[ies]" in the IRPs and did not consider the Companies' financial solvency in the context of DEC/DEP's service obligation under S.C. Code Ann. § 58-37-40(B)(1)(e). (Tr. p. 72 l. 11 - p. 74 l. 2.) Vote Solar offered undisputed evidence that: (i) the Climate Report "was not used in any way in the development of the [Proposed] IRPs" (HE. 4 p. 2); (ii) the inputs used to develop the Climate Report were not used in the Proposed IRPs; and (iii) insights achieved from the Climate Report analysis were not integrated into the Proposed IRPs. (HE. 4 p. 1; Tr. p. 240 [Santoianni].) The Companies further did not perform any "analysis on the incidence of climate risk on [DEC/DEP's] . . . assets, operations, and earnings" (HE. 4 p. 1 and Tr. p. 97 l. 7-18) or on the "risk of increased property insurance premiums." (HE. 4 p. 1; Tr. p. 98 l. 21 - p. 99 l. 2) The latter is specifically enumerated in the Climate Report. (HE. 5 p. 19.)

Companies Witness Roberts' rebuttal testimony focuses on the Companies' obligation to meet reliability standards as set out by the North American Electric Reliability Corporation ("NERC"). Roberts argues Fitch "fails to address the Companies' obligation to manage operational risks and to meet NERC reliability requirements" (Tr. p. 1052.4 l. 9-16.) During cross examination by Vote Solar, however, Mr. Roberts allowed that his testimony was offered to show the Proposed IRPs would permit the Companies to comply with NERC reliability requirements, not whether another resource plan that considered carbon stranding (i.e., one of Fitch's recommendations) would preclude compliance with NERC reliability requirements. (See Tr. p. 1134. l. 14-25.) Consistently, Roberts did not know whether the Proposed IRPs contained a sensitivity analysis relative to stranded asset costs associated with the 2050 Commitment. (Tr. p. 1137 l. 8 - p. 1140 l. 3.) Mr. Roberts also acknowledged that Vote Solar had not suggested the Companies ignore their NERC reliability requirements (Tr. p. 1149 l. 19-22) and also admitted that the diverse portfolios

offered in the Proposed IRPs would all equally permit DEC/DEP to comply with NERC reliability requirements (Tr. p. 1084 l. 3-8.)

Ms. Santoianni testified the *exclusive* consideration given to climate risk in the Companies' IRPs was (1) inclusion of a carbon price and (2) ensuring the various resource portfolios permit DEC/DEP to achieve the North Carolina Clean Power Plan, the 2030 Target, and the 2050 Commitment. (Tr. p. 1550 l. 17 - p. 1551 l. 14.) Notwithstanding, Ms. Santoianni conceded that the Proposed IRPs do not contain any analysis on the Companies' ability to achieve the 2050 Commitment beyond 2035. (Tr. p. 1546 l. 12-22; *see also* HE. 1, Snider DEC Ex. 1 and Snider DEP Ex. 2 at p. 140, Fig. 16-B.) DEC/DEP witness Mark Oliver is the Companies' 'Vice President, Integrated Systems Planning' and leads integrated resource planning. (Tr. p. 1331 l. 6-16.) Mr. Oliver testified the Companies' claim—that the IRPs keep the utility on a “trajectory” to meet the 2050 Commitment—is based on “the observation” that the same pathways reach the 2030 Target. (Tr. p. 1351 l. 22 - p. 1352 l. 11.) Mr. Oliver concedes, however, that IRP modeling did not extend beyond 2035 (Tr. p. 1354 l. 13-16.)

Commission Conclusion

1. Rejection of the Proposed IRPs

DEC/DEP would ask the Commission to find that the Proposed IRPs are “wholly consistent with [the Companies'] climate plan and . . . commitment.” (Tr. p. 134 l. 12-17 [Snider].) The Commission recognizes DEC/DEP's effort to integrate a carbon price and to model the Companies' 2030 target. (Tr. p. 1551 l. 2-5.); however, the evidence in the proceeding does not support such a finding. The evidence shows, instead, the Companies did not adequately assess and incorporate the Identified Climate Risks in the development or evaluation of the Proposed IRPs, and that such inadequacy presents possible economic exposure for the Companies' ratepayers.

The Companies do not dispute that they did not conduct an assessment of climate-related risks or evaluate risk exposure to ratepayers in the development of their Proposed IRPs. The Companies

further do not dispute that they did not examine their claim that the Proposed IRPs “put Duke Energy on a trajectory to achieve its climate goals[]” (Tr. p. 224.18 l. 11-13 [Santoian]) beyond 2035. In the Commission’s view, it is incongruous that Duke Energy Corporation would develop and publish a sophisticated acknowledgment and response to climate risk (i.e., the Climate Report), but affirmatively avoid incorporating many of those risks into the Companies’ resource planning. While the Commission agrees with Witness Roberts that maintaining system reliability is a critical consideration, achieving reliability does not require that the Commission avoid consideration of the other balancing factors identified in Act 62. Without meaningful assessment and management of the Identified Climate Risks, the Commission cannot find that the Proposed IRPs are the most reasonable and prudent plan for meeting a utility’s energy and capacity needs. By failing to provide due consideration of the Identified Climate Risks, the Companies did not demonstrate that the Proposed IRPs represent the most reasonable and prudent means of meeting DEC/DEP’s energy and capacity needs. Accordingly, the Commission rejects the Proposed IRPs.

Given the analysis and consideration required to develop tools for assessing and managing the Identified Climate Risks, the Commission orders DEC/DEP to make certain, limited changes to the Modified 2020 IRPs within the sixty-days prescribed by S.C. Code Ann. § 58-37-40(C)(3), as further set out in the Ordering Paragraphs.

2. Assessment of Identified Climate Risks

In simple terms, DEC/DEP cannot manage what they do not measure. A high-level overview of climate-related risks to Duke Energy’s corporate position is not an adequate substitute for an in-depth and comprehensive review of the Identified Climate Risks posed to the Companies and their ratepayers, nor does it provide specific and actionable information on the implications of the Proposed IRPs on Identified Climate Risks. Other activities cited by DEC/DEP Witnesses, such as the application of a reference carbon price or scenario analysis, represent a piecemeal approach to a

potentially systematic issue. These elements are not adequate to the task of assessing the Identified Climate Risks, and a systematic, holistic review of DEC/DEP's exposure is necessary.

The Commission concludes it is appropriate to require DEC/DEP to conduct a systematic Assessment of the existence and impact of Identified Climate Risks, and to utilize the results of the Assessment in future IRPs and related proceedings. The Companies shall submit the Assessment as an attachment to future IRPs. The Commission directs DEC/DEP to develop the Assessment in the context of the Stakeholder Group that the Commission is directing the Companies to convene as a part of this Order. At the discretion of the Stakeholder Group, the Companies and/or any Stakeholder may engage with a third-party consultant to provide analysis in support of the Assessment.

3. *Stakeholder Group*

In order to provide the time and consideration necessary for developing and implementing changes to DEC/DEP's resource planning methodology, the Commission orders DEC/DEP to convene a Stakeholder Group. The primary purposes of the Stakeholder Group will be development of the Assessment of Identified Climate Risks, as described elsewhere in this Order, and development of metrics and indicators for assessing and managing the Identified Climate Risks throughout the integrated resource planning process (to include but not limited to model operation, plan development, scenario selection, and scenario evaluation). Participants in the Stakeholder Process should be comprised of representatives from multiple interest groups, including but not limited to low-income advocates, residential and industrial classes of ratepayers, along with ORS and the Intervenors, should they choose to participate.

C. Assessing and Managing Identified Climate Risks

1. *2050 Commitment*

EVIDENCE AND CONCLUSION SUPPORTING FINDING OF FACT NO. 5

The evidence in support of this finding of fact is found in the Proposed IRPs, pleadings, testimony and exhibits in these Dockets, and the entire record in this proceeding.

Vote Solar Evidence

Vote Solar Witness Fitch testified the Companies did not offer any corroborating analysis or evidence to support the claim that the Proposed IRP's candidate resource plans are consistent with meeting the 2050 Commitment, (Tr. p. 736.66 l. 15 — 736.67 l. 3) although DEC/DEP's IRPs do admit that cost and investment trajectories may differ across portfolios and additional investment will be needed 2036-2050 to reach the 2050 Commitment. (Tr. p. 736.87 l. 7-18.) Mr. Fitch, on the other hand, projected future portfolio emissions based on proposed new generation assets in the Base Case with Carbon Policy and historical average emissions for the Companies' gas-fired generation fleet. Based on this analysis, Fitch found that DEC/DEP emissions in 2050 could be as high as 30 million metric tons per year. (Tr. p. 736.71 l. 14 — 736.72 l. 2.) Mr. Fitch's testimony also identified short- and long-term feasibility issues with the Proposed IRPs' use of carbon offsets, carbon capture and storage and renewable natural gas (*See*: Tr. p. 736.73 l. 1-16 and Tr. p. 736.82 l. 12 — 736.83 l. 16). Mr. Fitch's testimony cited a September 2020 report published by management consultant firm Deloitte concluding that "the math doesn't yet add up" on reconciling Duke Energy Corporation's carbon commitments with their investment plans. (Tr. p. 736.69 l. 3-8.)

Witness Fitch also assessed DEC/DEP's methodology for projecting annual revenue requirements for the Proposed IRPs through 2050, and found the Companies' practice of escalating annual revenue requirements by a flat percentage distorts costs within and across candidate resource plans:

"Portfolios that invest more in a transition to zero-carbon generation over the planning period have any increased carrying costs locked in 2036-2050, and even though the Company acknowledges additional generation investments will be required in [its] less ambitious scenarios, lower carrying costs for those less ambitious scenarios will also be locked in, 2036-2050."

(Tr. p. 736.88 l. 13-17) (emphasis in original).

Mr. Fitch concludes these distortions are "unacceptable" for purposes of making "an informed decision on reasonable and prudent planning." (Tr. p. 736.88 l. 17-22.) According to Fitch, the result

of such treatment is that “delay is incentivized because necessary future investments are not accounted for, while prudent early investment does not entail any relative cost benefit in later years.” *Id.*

DEC/DEP Evidence

Evidence presented by DEC/DEP in this proceeding and discussed in the preceding summaries of evidence in this Order show that the Companies’ Witnesses claimed that the IRPs were consistent with the 2050 Commitment, but they also conceded that no supporting assessment was conducted. (*See*: HE. 4 p. 1.; Tr. p. 240; Tr. p. 97 l. 7-18; Tr. p. 1546 l. 12-22; Tr. p. 1354 l. 13-16.) Companies’ Witnesses also acknowledged that this Commission and the North Carolina Utilities Commission have both applied scrutiny to integrated resource plans’ fulfillment of long-term zero-carbon commitments. (*See*: Tr. P. 1545 l. 8-16; Tr. p. 1544 l. 16-24.)

DEC/DEP Witness Snider provided additional detail on the role of integrated resource planning in implementing the 2050 Commitment. Mr. Snider testified the Corporation acknowledges that: addressing climate change risk is a long-term, “path dependent process;” achieving the 2050 Commitment requires “planning and executing now,” and, importantly, that “investments [made] near-term” are “foundational to achieving net-zero by mid-century.” (Tr. p. 110 l. 18 – p. 111 l. 22 (emphasis added).)

Commission Conclusions

Evidence previously established in this Order demonstrates that the Identified Climate Risks merit careful review by DEC/DEP and the Commission to ensure that the Companies and their ratepayers are not exposed to undue risk. The Commission agrees with Witness Santoianni’s contention that the Commission’s role is not to “codify climate policy.” (Tr. p. 1536.8 l. 20-22.) However, the Companies’ voluntary, public commitment to net-zero emissions by 2050 reflects the need to consider the long-term implications of the Identified Climate Risks. This Commission assumes DEC/DEP would not make its 2050 Commitment if it did not intend to achieve it, nor would it make the commitment if it were not in the best interests of DEC/DEP and their ratepayers. Therefore, the

Commission hereby requires the Companies' IRPs to demonstrate, rather than assert, their ability to implement this commitment.

By assuming that all candidate resource plans are consistent with the Companies' 2050 Commitment, without any consideration of the resources required to do so—and while ignoring potential differences in costs and implementation—the Proposed IRPs effectively ask the Commission to ignore Identified Climate Risks (i.e., transition risk) within the Proposed IRPs. DEC/DEP's use of unsupportable modeling assumptions impedes the Commission's ability to determine whether the Proposed IRPs are the most reasonable and prudent means of meeting the utility's energy and capacity needs, and the Companies shall remedy these assumptions in future IRPs. The Commission finds it prudent to direct the Companies to integrate implementation of the 2050 Commitment into its IRPs, and provide, at minimum, a qualitative comparative assessment of the cost and feasibility implications of implementing the 2050 Commitment across candidate resource plans. The Commission directs DEC/DEP to develop a methodology for considering long-term energy transition issues in the Stakeholder Group as a part of this Order.

2. *Reference Carbon Price*

EVIDENCE AND CONCLUSION SUPPORTING FINDING OF FACT NO. 6

Summary of Evidence

The evidence in support of this finding of fact is found in the Proposed IRPs, pleadings, testimony and exhibits in these Dockets, and the entire record in this proceeding.

Vote Solar Witness Fitch discussed DEC/DEP's use of reference carbon prices in direct testimony. (*See*: Tr. p. 736.49 l. 11 — 736.52 l. 21.) He found the reference prices used by the Companies “no longer provide an appropriate benchmark” because the Companies identified reference policies are at a higher level than DEC/DEP's reference prices. (Tr. p. 736.49 l. 11-12.) His testimony identified a previous Order by this Commission finding, “It is in the public interest for the risk of potential carbon pricing to also be considered and balanced under [Act 62].” (Tr. p. 736.52 l. 5-7.)

Fitch also concluded that the Companies’ decision to adjust reference CO₂ prices in order to drive a desired outcome was inconsistent with the purpose of sensitivity analysis. (*See* Tr. p. 736.51 l. 11 — 736.52 l. 3.) Mr. Fitch recommended that DEC/DEP adopt reference CO₂ prices developed and used by the U.S. Energy Information Administration (“EIA”) in their 2020 Annual Energy Outlook (“AEO”), which start at \$15, \$25, and \$35 per ton of carbon dioxide and escalate at a five percent rate annually. (Tr. p. 736.52 l. 16-21.)

DEC/DEP Witness Santoianni contended that the Companies’ chosen prices “escalate faster and rise to higher prices than other carbon policies studied.” (Tr. p. 1636.10 l. 9-10.) DEC/DEP Witness Snider reiterated the Companies’ choice to set reference prices at a level “strong enough to incentivize technologies to further decarbonize over the planning horizon without resulting in reliability disruption or severe price shock.” (Tr. p. 1586.137 l. 15-17.)

Commission Conclusion

This Commission has previously found it is in the public interest for the risk of potential carbon pricing to be considered and balanced under Act 62. Reference prices used in the context of integrated resource planning are intended to assess the impact of new regulations on plan costs and resource decisions. The insights from applying these reference prices are only helpful to the extent that the reference prices accurately approximate legislation under consideration. Evidence presented in this proceeding demonstrates that the reference prices used in the Proposed IRPs do not approximate actual policies. The Commission also finds that DEC/DEP’s decision to set prices at a subjective level that may “incentivize technologies to further decarbonize” does not achieve the purpose of evaluating regulatory risk, and there is no evidence in this proceeding that use of a different reference price would result in disruptions to reliability or affordability. The Commission therefore orders that DEC/DEP—in its 2020 Modified IRPs, future IRPs, and Annual Updates—shall use the US EIA AEO carbon pricing sensitivities (\$15, \$25, and \$35 per ton of carbon dioxide, escalating at a five percent rate annually) recommended by Mr. Fitch.

3. *Capacity Sharing*

EVIDENCE AND CONCLUSION SUPPORTING FINDING OF FACT NO. 7

Summary of Evidence

The evidence in support of this finding of fact is found in the Proposed IRPs, pleadings, testimony and exhibits in these Dockets, and the entire record in this proceeding.

Vote Solar Witness Fitch's direct testimony described DEC/DEP's current regional coordination practice and reviewed several studies of potential cost and carbon emission reductions of regional coordination across DEC/DEP's service territory. (*See*: Tr. p. 736.57 l. 10 — 736.63 l. 6.) Mr. Fitch's testimony demonstrated that several options for regional coordination are available to DEC/DEP (Tr. p. 736.59 l. 6-19), and that the Companies acknowledged that such arrangements could lead to deferral of generation investments and more cost-effective integration of zero-carbon generation. (Tr. p. 736.60 l. 5-9.) Nevertheless, Mr. Fitch's review of DEC/DEP's Proposed IRPs found that the Companies declined to explore several regional coordination options, including joint capacity planning across DEC and DEP service territories (Tr. p. 736.60 l. 9-12) and integration into a regional transmission organization (Tr. p. 736.61 l. 1-2).

DEC/DEP Witness Santoianni claimed that exploration of regional coordination is not appropriate for the scope of integrated resources planning. (Tr. p. 1536.22 l. 6-8.) Her testimony also introduced South Carolina Act 187, passed into law in September 2020, that would establish a Market Reform Study Committee to study regional electricity coordination in detail. (*See* Tr. p. 1536.23 l. 3 – 1536.24 l. 2.)

Commission Conclusion

The Commission determines that consideration of regional coordination is within the public interest and otherwise contemplated by the various balancing factors enumerated in S.C. Code Ann. § 58-37-40(C)(2). It is therefore reasonable for electric utilities to explore the use of regional coordination to meet their capacity needs in a prudent and reasonable manner in the context of

integrated resource planning. The Commission recognizes regional coordination arrangements could be subject to regulatory approval by multiple bodies, but procedural barriers should not and do not preclude the Companies or the Commission from exploring the potential benefits of these arrangements.

Evidence in this proceeding demonstrates that regional coordination structures could enhance the Companies' ability to achieve the balancing factors described in Act 62, and despite the Companies' acknowledgement of these potential benefits, the Companies declined to incorporate them into the Proposed IRPs. Although additional regulatory actions at this Commission and other venues may be required to shift toward some regional coordination arrangements, understanding the feasibility and potential ratepayer benefits of these arrangements could inform the Commission's judgment on the most prudent and reasonable means for meeting energy and capacity needs in this and future IRPs.

The Companies' have acknowledged the potential benefits of joint capacity planning (Tr. p. 736.60 l. 4-9) and repeatedly noted their intent to study the benefits of joint capacity planning in the context of integrated resource planning. (Tr. p. 736.60 l. 9-12.) It is therefore reasonable for the Commission to direct the Companies to further investigate the regulatory pathway toward implementation of joint capacity planning. The Short Term Action Plans of the Modified 2020 IRPs shall include Joint Capacity Action Plans that identify required changes to the joint dispatch agreements, anticipated regulatory approvals required, and expected timeline for implementation.

4. Intervenor Software Licenses

EVIDENCE AND CONCLUSION SUPPORTING FINDINGS OF FACT NO. 8

Summary of the Evidence

The evidence in support of this finding of fact is found in the Proposed IRPs, pleadings, testimony and exhibits in this Dockets, and the entire record in this proceeding.

Vote Solar Witness Fitch recommended, in order to enhance collaboration and transparency, that the Commission direct the Companies to procure intervenor licenses and sharing inputs for

capacity expansion and production cost modeling in future IRPs. (Tr. p. 736.57 l. 4-9.) He also described Public Service New Mexico's efforts to integrate stakeholder input through shared access to modeling software. (See Tr. 742.28 l. 1 — 742.29 l. 4.) According to Fitch, Public Service Company of New Mexico's ("PNM") 2020 IRP used the EnCompass integrated resource planning software and shared a server-based intervenor license with stakeholders, allowing intervenors to provide inputs and conduct alternative model runs. *Id.*

DEC/DEP Witness Snider objected to Mr. Fitch's recommendation on grounds the Companies already provide reasonable discovery to intervening parties, and that intervenor licenses would be an unreasonable expansion of discovery. (Tr. p. 1586.163 l. 5-15.) Mr. Snider argued that the Commission's recommendation in the case of the DESC proceeding was specific to transparency barriers with DESC's selected PLEXOS software. (Tr. p. 1586.164 l. 6-17.) Finally, Mr. Snider noted that procuring a license alone would not be enough to facilitate use by intervenors and stakeholders because of the technical resources and expertise required to effectively use the software. (Tr. p. 1586.165 l. 15 — 1586.166 l. 4.)

Commission Conclusion

The Commission believes that increasing collaboration between DEC/DEP, ORS, and stakeholders is in the public interest, and the Public Service of New Mexico example discussed by Witness Fitch presents a compelling example for deeper collaboration between the Parties.

The Commission does not find the objections raised by Mr. Snider compelling. Witness Snider's complaint that such a license would come at gratuitous cost to ratepayers conflicts with his contention that the EnCompass license is significantly more affordable than the PLEXOS license. (Tr. p. 1586.164 l. 12-20.) Further, his objection that intervenors may not be able to use the EnCompass software (Tr. p. 1586.165 l. 22 – 1586.166 l. 4) is resolved in the PNM example by using a server-based license (Tr. p. 742.28 l. 1 – 742.29 l. 4).

During the development of future IRPs, the Companies shall make available, without the need for a data request, the modeling inputs and outputs, assumptions, and post-processing spreadsheets, in electronic spreadsheet format, and the EnCompass manual. The Companies shall also make efforts to procure a server-based Encompass installation that allows for intervenor use.

VI. ORDERING PARAGRAPHS

NOW, THEREFORE, IT IS HEREBY ORDERED THAT:

1. Based upon the Proposed IRPs, the testimony, and exhibits received into evidence at the hearing and the entire record of these proceedings, the Commission hereby adopts each and every Finding of Fact enumerated herein. The Commissions' conclusions of law are fully stated above.

2. Any motions not expressly ruled upon herein are denied.

3. The Commission rejects the Proposed IRPs. DEC/DEP shall file two Modified 2020 IRPs, modified consistent with the directives of this Order, within sixty (60) days of the final order in accordance with S.C. Code Ann. Section 58-37-40(C)(3).

4. The Modified 2020 IRPs shall be complete, stand-alone documents.

5. DEC/DEP, in coordination with ORS, shall establish a Stakeholder Group for the purpose of considering and inviting stakeholder input and review on changes to DEC/DEP's IRP development methodology, inputs, and assumptions, as provided herein. The Stakeholder Group shall consider the following issues, *but exclusively as to the Identified Climate Risks*:

1. Development of a procedure for integration of up-to-date climate science and physical climate-related phenomena into load forecasting, physical impacts on generation assets, and resource adequacy studies;
2. Development of the Assessment, potentially with the assistance of a third-party consultant, to be implemented within the Companies' IRPs;

3. Development of quantitative and/or qualitative metrics of climate-related transition risk exposure, including but not limited to projected emissions, implied annual capacity factor, remaining depreciation lifetime of carbon-emitting assets, potential stranded asset or accelerated depreciation costs, implied low-carbon retrofit and low-carbon fuel infrastructure costs, compliance with long-term carbon commitments, and an estimation of required investment after the planning horizon to comply with carbon commitments;
4. Integration of climate-related transition risk exposure using the above metrics into capacity expansion and production cost model operation, integrated resource plan development, plan scenario selection, and evaluation;
5. Review of the Companies' current practices used to project long-term revenue requirements for IRP scenarios, and development of alterations or alternate methodologies to reconcile long-term cost trajectories with long-term climate-related risks;
6. A holistic assessment of cost and feasibility considerations of zero-carbon retrofits to current carbon-emitting infrastructure, including but not limited to carbon capture, transport, and storage (i.e., CCS), and fuel substitution by renewable natural gas and/or zero-carbon hydrogen, and integration of these considerations into IRP development and scenario selection, including but not limited to feasibility and cost considerations;

7. Consideration of strategies to mitigate climate-related risks across DEC/DEP's portfolio, including but not limited to broader regional coordination and integrated distribution planning;
 8. Development and consideration of risk-adjusted metrics to compare and contrast climate-related risks across scenarios;
 9. Consideration of the appropriate planning horizon, potentially to exceed fifteen years, to best manage long-term climate-related risks; and
 10. Any other issues, as agreed on by the parties to the Stakeholder Group.
6. DEC/DEP shall report on the composition and utilization of the Stakeholder Group in their Annual Updates; and
7. As a part of ORS's report to the Commission providing review of DEC/DEP's Annual Updates, ORS shall review the progress of the Stakeholder Group and determine whether the Stakeholder Group is appropriately implementing this Order.
8. In the Modified 2020 IRPs and in the Annual Updates, DEC/DEP shall, exclusively as to the Identified Climate Risks:
- a. Re-model the costs of all candidate resource plans with the following changes to the modeling methodology and assumptions:
 - i. Use a twenty-five-year depreciation lifetime for new gas-fired generation assets; and
 - ii. Re-run its production cost modeling using the Energy Information Administration's 2020 Annual Energy Outlook reference prices described by Vote Solar Witness Fitch in his direct testimony;

- b. Include a high-level discussion of investments needed to implement DEC/DEP's carbon commitments for each scenario and integrate a qualitative indicator of relative cost and feasibility implications of meeting the 2050 Commitment by scenario, similar to the "Dependency on Technology & Policy Advancement" indicators used in DEC/DEP's Proposed IRPs; and
- c. Develop a Joint Capacity Action Plan that specifically identifies required changes to the Companies' existing joint dispatch agreements, anticipated regulatory approvals required, and procedural steps and timeline necessary to receive such approvals.

9. In future IRPs, DEC/DEP shall implement the following changes to the methodologies used to develop, analyze, and select resource plans, exclusively as to the Identified Climate Risks:

- a. Adopt and implement the use of Anchor Software's EnCompass capacity expansion and production cost modeling software. DEC/DEP shall negotiate a server-based license for EnCompass capacity expansion and production cost modeling software and negotiate a discounted, project, based licensing fee that permits intervenors the ability to perform their own modeling runs using the same software package as DEC/DEP. The Companies shall absorb the cost of these licensing fees, as discussed in Vote Solar Witness Fitch's surrebuttal testimony. Contemporaneously with the filing of each future IRP, DEC/DEP shall make available, without the need for a data request, the modeling inputs (including settings) and outputs, assumptions, and

post-processing spreadsheets (to create the revenue requirements) in electronic spreadsheet format, and the model manual.

- b. Use CO₂ reference prices as defined by the US Energy Information Administration's Annual Energy Outlook, as described in Mr. Fitch's direct testimony;
- c. Use a twenty-five-year depreciation lifetime for new gas-fired generation assets, unless costs for specific and demonstrably feasible low-carbon retrofits are explicitly accounted for within the IRPs;
- d. Develop one or more illustrative scenario that includes the assumption that DEC and DEP are able to share firm capacity across service territories;
- e. Use a planning horizon consistent with the outcomes of the Stakeholder Group;
- f. Incorporate up-to-date climate science and physical climate-related phenomena into load forecasting, physical operation of generation assets, and resource adequacy determinations, as agreed on by the parties to the Stakeholder Group;
- g. Include the Assessment of the Companies' generation assets and operations relevant to integrated resource planning, as agreed on by the parties to the Stakeholder Group; and
- h. Incorporate quantitative and qualitative metrics of climate-related risk exposure into model operation, plan development, scenario selection, and scenario evaluation, as agreed on by the parties to the Stakeholder Group.

10. In its 2020 Modified IRPs and Annual Updates, prepared pursuant to S.C. Code Ann., § 58-37-41(D)(1), DEC/DEP shall update its planning assumptions relating to the energy and demand forecast, commodity fuel price inputs, renewable energy forecast, energy efficiency and demand-side management forecasts, and changes to projected retirement dates of existing units. However, other than as required in this Order, DEC/DEP shall not make any changes to their modeling or other methodologies, or the sources of data from which they derive their planning assumptions, without disclosing those changes with their updates, and describing in concrete and specific terms the impact of those changes on the analysis in the IRPs. The Commission may in its discretion permit public comment and/or intervenor testimony regarding any such changes.

11. DEC/DEP shall include in their Modified 2020 IRPs and in future IRPs Short Term Action Plans identifying and describing the steps it will take to implement the IRPs during a five-year period, including but not limited to additional analyses, changes to its methodology, issuance of Request for Proposals, and applications for new generating facilities under the Siting Act. The Action Plans in the Modified 2020 IRPs shall reflect the updated IRP methodology directed in this Order and include, at a minimum, the Joint Capacity Action Plans described in this Order and DEC/DEP's anticipated analyses, studies, actions, meetings, recommendations, and changes in methodology reached in conjunction with stakeholders through the Stakeholder Group. Notwithstanding the Commission's decision to approve or reject the Modified 2020 IRPs overall, the Commission may find the Modified 2020 IRPs' Short Term Action Plans to be suitable for planning purposes in the period between the completion of the Modified 2020 IRPs and the next IRPs.

12. This Order shall remain in full force and effect until further order of the Commission.